WHAT IS CLAIMED IS:

1. A method for evaluating thermal comfort of a structure constituted by a first, second, … n-th part (n is a natural number of at least two) wherein at least one of these parts is a translucent member for introducing light to the inside, the method for evaluating thermal comfort of a structure comprising:

a step (a) of preparing data (1) of the material property of the first part, the material property of the second part, … the material property of the n-th part, and data (2) of an mount of solar radiation passing through the translucent member to reach a measuring device having a shape imitating a human body part, an amount of solar radiation to the structure, an amount of convection heat transfer in the structure, an amount of radiation heat transfer in the structure, humidity in the structure and/or a thermo-regulating function of the measuring device, and calculating at least one of the amount of heat loss from the surface of the measuring device, the temperature of the measuring device and/or the wettedness at the surface of the measuring device based on at least one in each of data (1) and (2), and

a step (b) of calculating a thermal comfort index of the measuring device by using a result of the above calculation.

2. The method for evaluating thermal comfort of a structure according to Claim 1, wherein said step (b)

comprises:

selecting and reading the material property registered in said data base for each part, and preparing at least one combination among registered material properties,

calculating, in combined operations, at least two of the calculation of the amount of solar radiation passing through the translucent member to reach a measuring device having a shape imitating a human body part, the calculation of the amount of solar radiation to the structure, the calculation of the amount of convection heat transfer in the structure, the calculation of the amount of radiation heat transfer in the structure, the calculation of the humidity in the structure and/or the calculation of the thermo-regulating function of the measuring device with respect to each combination of material properties thus prepared,

calculating at least one of the amount of heat loss from the surface of the measuring device, the temperature of the measuring device and/or the wettedness at the surface of the measuring device,

calculating at least one among the amount of heat loss from the surface of the measuring device, the temperature of the measuring device and/or the wettedness at the surface of the measuring device, and

calculating the thermal comfort index of the measuring device by using a result of the above

calculation.

3. The method for evaluating thermal comfort of a structure according to Claim 1, wherein said material property is the material property of a material of each of said parts or a value indicating a shape of each of said parts.

4. The method for evaluating thermal comfort of a structure according to Claim 1, wherein said measuring device includes a heat source.

5. The method for evaluating thermal comfort of a structure according to Claim 1, wherein said measuring device is a thermal manikin having a thermo-regulating function.

6. The method for evaluating thermal comfort of a structure according to Claim 5, wherein the thermo-regulation of the thermal manikin is carried out by (a) adjusting an amount of heat generated from a heat source so that the temperature of a skin layer of the thermal manikin is constant, (b) making the heat generated from a heat source constant, or (c) balancing the temperature of the skin layer of the thermal manikin with a sensible heat loss at the surface of the skin layer in response to the ambient circumstances of the thermal manikin.

7. The method for evaluating thermal comfort of a structure according to Claim 5, wherein said step (b) comprises:

a step (b1) of preparing a surface model of the

structure by dividing the shape of inner surface of the structure into a plurality of surface elements, preparing a surface model of a human body by dividing the shape of outer surface of the manikin in the structure into a plurality of surface elements and preparing an indoor space model by dividing the indoor space between the structure and the thermal manikin into a plurality of cubic elements,

a step (b2) of classifying the surface model of human body into a plurality of parts corresponding to parts of the thermal manikin, and installing a thermo-regulation model for balancing heat generated in the thermal manikin with heat radiated from the thermal manikin in each of the parts,

a step (b3) of obtaining an amount of heat transported by the solar radiation passing through the translucent member to reach the surface model of human body and the structure, convection in the indoor space, radiation from the surface model of human body and radiation from the surface model of the structure by a numerical simulation based on the calculation of the indoor space model, and calculating temperature and air flow fields in the indoor space based on a result of the simulation,

a step (b4) of calculating at least one of the amount of heat loss from the skin surface of the thermal manikin, the temperature at the skin of the thermal manikin and/or

the wettedness at the surface of the thermal manikin by a numerical simulation using the thermo-regulation model based on the temperature and air flow fields, the humidity around the thermal manikin, an amount of clothing on the thermal manikin and/or an amount of the activity of the thermal manikin, and

a step (b5) of calculating a thermal comfort index at the skin surface of the thermal manikin by using at least one of the heat loss, the skin temperature and/or the wettedness.

8. The method for evaluating thermal comfort of a structure according to Claim 1, wherein the translucent member is at least one member selected from the group consisting of a single glazing glass sheet, an insulated glazing glass sheet, a laminated glass sheet formed by sandwiching an organic resin layer by a plurality glass sheets, an organic resin layer, an organic resin plate and an organic glass sheet.

9. An assisting method for designing a structure in consideration of thermal comfort, the structure being constituted by a first, second, … the n-th part (n is a natural number of at least two) wherein at least one of these parts is a translucent member for introducing light to the inside, the assisting method for designing a structure comprising:

a step (a) of preparing at least one candidate value for each of the material property of a first part, the

material property of a second part, ... the material property of an n-th part, and registering candidate values of material properties of these parts in a predetermined data base,

a step (b) of selecting and reading the material property registered in said data base for each part, and preparing at least one combination among the registered material properties,

calculating at least one of the amount of heat loss from the surface of the measuring device, the temperature of the measuring device and/or the wettedness at the surface of the measuring device based on at least one in each of data (1) combinations of material properties thus prepared and (2) an mount of solar radiation passing through the translucent member to reach the measuring device having a shape imitating a human body part, an amount of solar radiation to the structure, an amount of convection heat transfer in the structure, an amount of radiation heat transfer in the structure, humidity in the structure and/or a thermo-regulating function of the measuring device, and

calculating a thermal comfort index of the measuring device by using a result of the above calculation, and

a step (c) of selecting a combination of material properties having a value closest to the optimum thermal comfort index.

10. The assisting method for designing a structure in

consideration of thermal comfort according to Claim 9, wherein said step (b) comprises:

selecting and reading, for each part, the material property registered in said data base, and preparing at least one combination among registered material properties,

calculating, in combined operations, at least two of the calculation of the amount of solar radiation passing through the translucent member to reach the measuring device having a shape imitating a human body part, the calculation of the amount of solar radiation to the structure, the calculation of the amount of convection heat transfer in the structure, the calculation of the amount of radiation heat transfer in the structure, the calculation of the humidity in the structure and/or the calculation of the thermo-regulating function of the measuring device with respect to each combination of material properties thus prepared,

calculating at least one of the amount of heat loss from the surface of the measuring device , the temperature of the measuring device and/or the wettedness at the surface of the measuring device,

calculating at least one among the amount of heat loss from the surface of the measuring device, the temperature of the measuring device and/or the wettedness at the surface of the measuring device, and

calculating the thermal comfort index of the

measuring device by using a result of the above calculation.

11. The assisting method for designing a structure in consideration of thermal comfort according to Claim 9, wherein said material property is the material property of a material for each of said parts or a value indicating a shape of each of said parts.

12. The assisting method for designing a structure in consideration of thermal comfort according to Claim 9, wherein said measuring device includes a heat source.

13. The assisting method for designing a structure in consideration of thermal comfort according to Claim 9, wherein said measuring device is a thermal manikin having a thermo-regulating function.

14. The assisting method for designing a structure in consideration of thermal comfort according to Claim 13, wherein the thermo-regulation of the thermal manikin is carried out by (a) adjusting an amount of heat generated from a heat source so that the temperature of a skin layer of the thermal manikin is constant, (b) making the heat generated from the heat source constant, or (c) balancing the temperature of the skin layer of the thermal manikin with a sensible heat loss at the surface of the skin layer in response to the ambient circumstances of the thermal manikin.

15. The assisting method for designing a structure in consideration of thermal comfort according to 13, wherein

said step (b) comprises:

a step (b1) of preparing a surface model of the structure by dividing the shape of inner surface of the structure into a plurality of surface elements, preparing a surface model of human body by dividing the shape of outer surface of the manikin in the structure into a plurality of surface elements and preparing an indoor space model by dividing the indoor space between the structure and the thermal manikin into a plurality of cubic elements,

a step (b2) of classifying the surface model of human body into a plurality of parts corresponding to parts of the thermal manikin, and installing a thermo-regulation model for balancing heat generated in the thermal manikin with heat radiated from the thermal manikin in each of the parts,

a step (b3) of obtaining an amount of heat transported by the solar radiation passing through the translucent member to reach the surface model of human body and the structure, convection in the indoor space, radiation from the surface model of human body and radiation from the surface model of the structure by a numerical simulation based on the calculation of the indoor space model, and calculating temperature and air flow fields in the indoor space based on a result of the simulation,

a step (b4) of calculating at least one of the amount

of heat loss from the skin surface of the thermal manikin, the temperature at the skin of the thermal manikin and/or the wettedness at the surface of the thermal manikin by the numerical simulation using the thermo-regulation model based on the temperature and air flow fields, the humidity around the thermal manikin, an amount of clothing on the thermal manikin and/or an amount of the activity of the thermal manikin, and

a step (b5) of calculating a thermal comfort index at the skin surface of the thermal manikin by using at least one of the heat loss, the skin temperature and/or the wettedness.

16. The assisting method for designing a structure in consideration of thermal comfort according to Claim 9, wherein the translucent member is at least one member selected from the group consisting of a single glazing glass sheet, an insulated glazing glass sheet, a laminated glass sheet formed by sandwiching an organic resin layer by a plurality glass sheets, an organic resin layer, an organic resin plate and an organic glass sheet.

17. The assisting method for designing a structure in consideration of thermal comfort according to Claim 9, wherein the material property of the translucent member is determined by a combination of the transmittance of solar radiation, the absorptance of solar radiation, the emissivity and the overall heat transfer coefficient.

18. The assisting method for designing a structure in

consideration of thermal comfort according to Claim 9, wherein said thermal comfort index is a comfort index based on equivalent temperature, standard effective temperature, predicted mean vote or a modified value of the standard effective temperature.

19. The assisting method for designing a structure according to Claim 9, wherein said structure has at least one selected from the group consisting of a heating, ventilation and air conditioning system, a radiation cooling/heating panel system, a ventilation system and a humidity controlling system, and said thermal comfort index is calculated in consideration of the selected system.

20. A thermal comfort evaluation program for a structure constituted by a first, a second, … an n-th part (n is a natural number of at least two) wherein at least one of these parts is a translucent member for introducing light to the inside, the thermal comfort evaluation program comprising program codes for instructing to a computer to realize the steps described in Claim 1.

21. A thermal comfort evaluation system for a structure constituted by a first, a second, … an n-th part (n is a natural number of at least two) wherein at least one of these parts is a translucent member for introducing light to the inside, the thermal comfort evaluation system for a structure comprising:

means for preparing data (1) of the material property

of the first part, the material property of the second part, … the material property of the n-th part, and data (2) of an mount of solar radiation passing through the translucent member to reach a measuring device having a shape imitating a human body part, an amount of solar radiation to the structure, an amount of convection heat transfer in the structure, an amount of radiation heat transfer in the structure, humidity in the structure and/or a thermo-regulating function of the measuring device, and calculating at least one of the amount of heat loss from the surface of the measuring device, the temperature of the measuring device and/or the wettedness at the surface of the measuring device based on at least one in each of data (1) and (2), and

means for calculating a thermal comfort index of the measuring device by using a result of the above calculation.

22. An assisting program for designing a structure constituted by a first, a second, … an n-th part (n is a natural number of at least two) wherein at least one of these parts is a translucent member for introducing light to the inside, the assisting program for designing a structure comprising program codes for instructing to a computer to realize the steps described in Claim 9.

23. An assisting system for designing a structure constituted by a first, a second, … an n-th part (n is a natural number of at least two) wherein at least one of

these parts is a translucent member for introducing light to the inside, the assisting system for designing a structure comprising:

(a) means for preparing at least one candidate value for each of the material property of the first part, the material property of the second part, … the material property of the n-th part, and registering candidate values of material properties of these parts in a predetermined data base,

(b) means for selecting and reading the material property registered in said data base for each part and preparing at least one combination among the registered material properties,

calculating at least one of the amount of heat loss from the surface of the measuring device, the temperature of the measuring device and/or the wettedness at the surface of the measuring device based on at least one in each of data (1) combinations of material properties thus prepared and (2) an mount of solar radiation passing through the translucent member to reach the measuring device in a form of a human body part, an amount of solar radiation to the structure, an amount of convection heat transfer in the structure, an amount of radiation heat transfer in the structure, humidity in the structure and/or a thermo-regulating function of the measuring device, and

calculating a thermal comfort index of the measuring

device by using a result of the above calculation, and

(c) means for selecting a combination of material properties having a value closest to the optimum thermal comfort index.